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ABSTRACT

This study investigated the effects of different types of learning communities in residence halls on the learning and intellectual development of first-year students at the University of Missouri (Columbia). Information sources included existing campus data and responses to the College Student Experiences Questionnaire. Compared to 469 students living in traditional residence halls, the 157 students living in learning communities within the university had significantly higher levels of involvement and interaction with significant others (faculty and peers), greater integration of information obtained in and outside of class, and greater gains in general education, which were attributed to higher levels of involvement in art, music, and theater, interactions with peers, and increased intellectual content of interactions. Learning communities tended to have direct positive effects on day-to-day behavioral aspects of students' college experiences and indirect effects on the integration of information and student learning. Higher levels of integration of course information for students in residential learning communities resulted largely from the positive effects of learning communities on involvement in clubs and organizations, involvement in residence halls, interaction with faculty and peers, and the intellectual content of interactions. (Contains 25 references.) (SW)

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The Effects of Residential Learning Communities on Students' Educational Experiences and Learning Outcomes During the First Year of College

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Abstract

Residential learning communities represent a potentially powerful vehicle for enhancing student learning and intellectual development. An analysis of 157 learning-community and 469 traditional-residence students at the University of Missouri–Columbia revealed that students in residential learning communities had significantly higher levels of involvement and interaction with significant others. They also reported greater integration of information obtained in and outside of class, as well as greater gains in general education. While learning communities directly affected involvement and interaction, the effects for integration and gains in general education were indirect, acting through enhanced involvement and interaction.

The Effects of Residential Learning Communities on Students' Educational Experiences and Learning Outcomes During the First Year of College

In an open letter to college presidents and chancellors, the Kellogg Commission on the Future of State and Land-Grant Universities (1997) called on American higher education to redouble its efforts to enhance students' learning and intellectual development. According to the Kellogg Commission, enhancing learning in general education and the development of intellectual skills during the first two years of college remain critical unmet needs confronting all of higher education. The Commission also observed that one method of improving student learning and intellectual development is through a tighter coupling of students' in- and out-of-class experiences.

The American College Personnel Association's (1994) The Student Learning Imperative: Implications for Student Affairs (SLI) also stressed the importance of creating seamless environments that focus on improving student learning and student success. According to the SLI's authors, the key to enhancing student learning and intellectual development lies in developing systems that motivate students to devote more time to "educationally purposeful activities, both in and outside the classroom" (p. 1).

Campus residence halls represent a potentially powerful venue for integrating students' diverse curricular and cocurricular experiences (Marchese, 1994). The educational potential of residence halls is a product of the fact that a substantial number of college students live in residence halls and the fact that residence halls provide educators with extended opportunities to influence students (Pike, Schroeder, and Berry, in press; Schroeder and Mable, 1994). While living in a residence hall, as opposed to living off campus or in Greek housing, is positively associated with higher levels of achievement, cognitive development, and persistence, the greatest gains in learning and intellectual development are found when residence hall environments are structured to reinforce classroom experiences (Schroeder, 1994). Students in residential learning communities, for example, have higher levels of academic achievement (i.e., grades), cognitive development, and persistence than do students in traditional residence halls (Blimling, 1993; Pascarella, Terenzini, and Blimling, 1994; Pike, Schroeder, and Berry, in press; Terenzini, Pascarella, and Blimling, 1996).

The present research focused on the efforts of one institution to enhance students' learning and intellectual development during the first year of college. More specifically, this study examined whether incorporating a variety of different types of learning communities into residence halls significantly enhanced students' learning and intellectual development. Three questions guided this research: First, do students living in residential learning communities report richer college experiences, and greater gains in general-education learning and intellectual development than do students living in traditional residence halls? Second, are the relationships between college experiences and educational outcomes the same for students living in residential learning communities and students living in traditional residence halls? Third, are observed differences in general learning and intellectual development the direct result of membership in a learning community or are they an indirect effect of enhanced college experiences for students in learning communities?

Background

Historically, the American public accepted at face value the claims made by colleges and universities about the quality and effectiveness of higher education (Pascarella and Terenzini, 1991). However, the rising cost of a college education, state budget crises, and declines in economic competitiveness at home and abroad, has made uncritical acceptance of these claims unlikely (Ewell, 1991; Graham and Cockriel, 1989). McClenney (1993) noted that American higher education "has permanently lost its place as a sacred priority in public funding" (p. 1). Indicative of the environment in which colleges and universities currently operate, McClenney reported that only 25 percent of the American public expressed a great deal of confidence in higher-education leadership, down from 61 percent in 1960.

Reflecting public dissatisfaction with higher education, several blue-ribbon advisory panels issued reports in the 1980s criticizing the quality of postsecondary education and calling on colleges and universities, as a means of improvement, to assess student learning. (Association of American Colleges, 1985; Boyer, 1987; National Governors' Association, 1986; National Institute of Education, 1984). In response, states, the federal government, and accrediting associations began requiring that colleges and

universities assess students' learning and development in order to improve the quality of their education programs (Ewell, 1991). Recent surveys indicate that more than 80 percent of college and universities have established, or are establishing, assessment programs (El-Khawas, 1991; Johnson, Prus, Andersen, and El-Khawas, 1991).

Despite the increased use of outcomes assessment for accountability and improvement, criticisms of higher education continue. Typical of these criticisms is the recent report An American Imperative: Higher Expectations for Higher Education issued by the Wingspread Conference on Higher Education (1993). In its report, the Wingspread Conference called upon colleges and universities to significantly improve undergraduate education—particularly general education. The Student Learning Imperative (SLI) (American College Personnel Association, 1994) also focused on the importance of enhancing undergraduate education. Rather than calling for better teaching, this document emphasized the importance of creating seamless learning environments that help students integrate their experiences, both in and outside the classroom (Schroeder, 1996).

Most recently, the Kellogg Commission on the Future of State and Land-Grant Universities (1997) called on public colleges and universities to commit to strengthening undergraduate education. Like previous commissions and advisory panels, the Kellogg Commission emphasized the importance of providing students with a broad general education and developing their higher-order intellectual skills. Consistent with the views expressed in the SLI, the Kellogg Commission stressed the importance of viewing all aspects of college life as learning experiences. The Commission argued that effective undergraduate education involves bridging students' in- and out-of-class educational experiences.

Research has provided empirical support for the importance of assisting students in integrating curricular and cocurricular experiences. Studies have found that students' gains in general education and intellectual development are the product of a variety of factors, including coursework and effort in studying, involvement in out-of-class activities, and interaction with faculty and peers (Astin, 1993; Kuh, Vesper, Connolly, and Pace, 1997; Pascarella and Terenzini, 1991). Campus residence halls provide one locale in which many of the college experiences that lead to gains in learning and intellectual development can converge (Schroeder and Mable, 1994). Not only do students spend a substantial amount of time in their residence halls, opportunities for involvement in extracurricular activities and interaction with peers abound. Compared to students who live off campus, residential students have significantly higher levels of involvement, faculty-student and peer interaction, satisfaction, and institutional commitment (Blimling, 1993; Pascarella, 1984; Pascarella, Terenzini, and Blimling, 1994; Terenzini, Pascarella, and Blimling, 1996). Not surprisingly, residence hall students are significantly more likely to persist than other students (Pascarella, Terenzini, and Blimling, 1994). What is surprising is that research has found little evidence that simply living in a residence hall enhances student achievement as measured by grades. Based on his meta-analysis of research on residence halls, Blimling (1989) concluded that residence-hall students have a slight grade advantage over commuter students and Greek-housing students. However, he cautioned that these results may not be generalizable due to the relatively small number of institutions included in his analyses and the lack of adequate statistical controls in many of the original students.

Student grades provide one indication of student learning, but grades alone can be misleading (see Ewell, 1991; Banta, 1993). Research using more direct measures of learning and intellectual development has also provided limited support for the claim that living in a residence hall is linked to greater gains in learning outcomes. Hood (1984), for example, found no significant relationship between living on or off campus and cognitive complexity, while Winter, McClelland, and Stewart (1981) found a negative relationships between residential living and projective measures of critical thinking. Because the Winter, McClelland, and Stewart study did not control for initial levels of critical-thinking ability, effects for residence halls may be confounded with other variables (Terenzini, Pascarella, and Blimling, 1996). In a more rigorously controlled study, Pascarella, Bohr, Nora, Zusman, Inman, and Desler (1993) found that residence-hall students had significantly higher scores on measures of critical thinking than did commuter students, even after controlling for differences in initial ability, background, and coursework. Residence-hall students also had slightly higher scores in reading comprehension, although no significant differences were found for math skills.

Because of the lack of a clear link between living in a residence hall and enhanced student learning, many institutions have attempted to create residence-hall environments that are explicitly designed to promote student learning and intellectual development (Schroeder and Hurst, 1993). These residential learning communities attempt to create environments which promote higher levels of student involvement in out-of-class activities, greater interaction between faculty and students, and a more supportive peer environment (Astin, 1993; Schroeder, 1994; Schroeder and Hurst, 1996; Terenzini, Pascarella, and Blimling, 1996). In general, students in residential learning communities show greater gains in learning and intellectual development than do students living in traditional residence halls or commuting to campus (Lacy, 1978; Pascarella and Terenzini, 1980, 1981; Pike, Schroeder, and Berry, in press). Interestingly, research by Lacy (1978), Pascarella and Terenzini (1980), and Pike, Schroeder, and Berry (in press) has found that the effects of residential learning communities tend to be indirect, acting through involvement and interaction with faculty and peers. Significantly, Pike, Schroeder, and Berry (in press) found that living in a residential learning community seemed to alter many of the relationships between college experiences and educational outcomes. They further observed that differences in the relationships among college experiences and educational outcomes may invalidate comparisons across groups.

Theoretical Model

A variety of theories and models have been advanced to explain why residence halls in general, and residential learning communities in particular, enhance student learning. Taken as a whole, theory and research suggest that at least three factors are associated with higher levels of learning and intellectual development for students living in residential learning communities. First, research shows that students living in residential learning communities tend to have greater opportunities for involvement in educationally purposeful activities outside the classroom (Astin, 1993; Schroeder, 1994; Schroeder and Hurst, 1996). Second, residential learning communities generally offer students greater opportunities to interact with faculty and peers, and the intellectual content of these interactions tends to be greater for students in residential learning communities than for any other group (Astin, 1993; Lacy, 1978; Pascarella and Terenzini, 1980; Pike, Schroeder, and Berry, in press). Third, residential learning communities tend to facilitate students' integration of diverse curricular and cocurricular experiences (Schroeder, 1994; Schroeder and Hurst, 1996). In part, higher levels of integration are the product of higher levels of involvement and interaction (Blimling, 1993; Terenzini, Pascarella, and Blimling, 1996); however, at least some of the gains in integration are a direct result of the social and intellectual milieu of the learning communities themselves (Pike, Schroeder, and Berry, in press; Tinto and Goodsell, 1993).

The theoretical model used to guide the present research is presented in Figure 1. Consistent with other theory and research, this model assumes that students' gains in learning and intellectual development are a product of three factors: involvement, interaction, and integration. Also consistent with previous theory and research, involvement and interaction are assumed to directly affect students' integration of their curricular and cocurricular experiences. In addition to college experiences, learning and intellectual development are influenced by students' pre-college characteristics (e.g., gender, ethnicity, and entering academic ability). These pre-college characteristics may also influence involvement and interaction, as well as integration of in- and out-of-class experiences.

Insert Figure 1 about here

The results of previous research on residential learning communities also suggests three key research questions. First, it is important to determine if there are absolute differences in the quality of the college experiences and learning outcomes of students in learning communities and students in other residential groups. Enhanced experiences and outcomes are the *raison d'être* for residential learning communities, and evaluating the absolute differences between learning-community students represents the most basic assessment of program impact.

Second, it is important to determine whether the relationships among background characteristics, college experiences, and educational outcomes are the same for students in residential learning communities and traditional residence halls. As previously noted, Pike, Schroeder, and Berry (in press) found that the factors associated with the academic success of students living in a residential learning community were different from the factors associated with the success of students in traditional residence hall. They explained that differences in the relationships between college experiences and educational outcomes can confound efforts to compare levels of student success and produce misleading interpretations of observed differences. Consequently, assessing the stability of the relationships between college experiences and learning outcomes across student groups is a basic validity check on the appropriateness of comparing differences between two residential groups. Third, it is important to determine whether the effects of residential learning communities are direct or indirect—acting through involvement, interaction, and integration. Pike, Schroeder and Berry (in press) found that while certain residential learning communities have a positive effect on persistence, that effect is indirect—acting through enhanced college experiences. The nature of these effects has significant implications for theories and models of how college affects students, as well as the development of educational programming in residential learning communities (Pike, Schroeder, and Berry, in press).

Research Methods

The setting for this research was the University of Missouri–Columbia (MU), the state's public, land-grant, research university. MU has an undergraduate enrollment of slightly more than 17,000 undergraduate students. Three distinct types of residential learning communities have been created at MU. The first of these is the Wakonse Residential Learning Community. Established in Spring 1993, the Wakonse Learning Community is a collaborative project between departments in student affairs and approximately 100 university faculty who have shown a commitment to innovation in teaching and learning. Students interested in living in the Wakonse residence must write an essay describing what they would contribute to and gain from the community. Students may remain in Wakonse throughout their college careers. Students selected for Wakonse are coenrolled in a humanities sequence taught in the residence and participate in a variety of academic and cocurricular experiences, including service learning, career exploration, and subject mastery workshops (see Schroeder and Hurst, 1996).

The second type of learning community available to students at MU is a series of theme-related floors in residence halls. Themes range from the fine arts to women in engineering. Admission to these learning communities is selective and students in the communities may have access to special facilities, such as practice and recital rooms for music or special computer laboratories for engineering students. Students may remain in learning communities throughout their college careers. A key element of every theme-related learning community is the development of academic and social support networks to facilitate student success (Schroeder, 1994).

The third type of residential learning community on the MU campus is Freshman Interest Groups (FIGs). In Fall 1995, there were 22 FIGs at MU. Students applied for a FIG during the preceding Spring and Summer were admitted as space was available. Each FIG contained no more than 20 students who lived together on the same floor in a residence hall, were coenrolled in three courses organized around an academic theme, and attended a 1-hour pass-fail seminar designed to teach students basic educational success strategies and assist them in integrating information obtained from in- and out-of-class experiences. Students remained in a FIG throughout their first year of college. Peer advisors—outstanding juniors and seniors who served as role models and linking agents between FIG students and faculty—were a key element in the FIGs program. Peer advisors also assisted faculty in teaching the FIG seminars (see Pike, Schroeder, and Berry, in press).

Participants

In Fall 1995, 3,845 first-time college (FTC) students matriculated at MU. International students and students living off campus (including Greek housing) were excluded from the current analyses. Students for whom complete background data (i.e., gender, ethnicity, ACT Assessment composite score, and high school class percentile rank) were not available, were also excluded from the analyses. Of the 2,406 remaining first-year students, 530 (22 percent) were living in residential learning communities. Approximately 62 percent of the students were female and 15 percent were classified as members of a

minority group (i.e., African American, Asian American, Hispanic, or Native American). Slightly less than 84% of the students were Missouri residents. The mean ACT Assessment composite score for these students was 25.2, and their mean high school class percentile rank was 78.8.

During the Winter 1995 semester the College Student Experiences Questionnaire (CSEQ) was mailed to all FTC students at MU. Using multiple follow-up procedures to enhance response rates resulted in 1,085 students returning the questionnaire—a response rate of approximately 35%. Of the returned questionnaires, 626 contained complete data for 157 students living in learning communities (26 percent of the respondents) and 469 students living in traditional residence halls (74 percent of the respondents). A comparison of the background characteristics of respondents and the research population is presented in Table 1. As indicated in the table, a higher percentage of students responding to the CSEQ were female (71 percent), while 11 percent of the respondents were classified as minority students. Students responding to the survey also had a significantly higher mean ACT Assessment composite score (25.9) and a slightly higher mean high school class percentile rank (84.2). No significant differences were found for in-state versus out-of-state residency or major (i.e., academic unit).

Insert Table 1 about here

A comparison of the background characteristics of learning-community students with students in traditional residence halls identified several important differences. For example, 75% of the students in traditional residence halls were female, compared to 66% of the students in learning communities. Students in traditional residence halls also had significantly lower ACT Assessment composite scores (25.7) than did students in learning communities (26.9). No significant differences were found for minority status or high school class percentile rank. It is important to note that the observed differences in gender and ACT Assessment composite score for the CSEQ respondents paralleled differences between learning-community and traditional residence-hall students in the research population.

Instruments

Data for the current study came from two sources—existing campus data and responses to the CSEQ. Four background variables were included in the analyses: (a) gender, (b) minority status, (c) ACT Assessment composite score, and (d) high school class percentile rank. Ten scales derived from students' responses to the CSEQ were used to represent students' college experiences and educational gains made during the first year of college. Data on the ten scales is included in Table 2. Student involvement was measured by three CSEQ scales: (a) involvement in art, music, and theatre, (b) involvement in clubs and organizations, and (c) involvement in campus residences. Alpha reliability coefficients for these scales ranged from 0.84 for involvement in art, music, and theatre to 0.90 for involvement in clubs and organizations.

Insert Table 2 about here

The interaction component of the college-effects model also included three CSEQ scales: (a) interaction with faculty, (b) interaction with peers, and (c) topics of conversation in interactions. Interaction with faculty was measured using 7 of the 10 CSEQ items included in the Faculty Experiences scale. The three items deleted from the scale focused on interaction with faculty on personal, rather than academic, topics. Alpha reliability for the 7-item scale was 0.84. All 10 items from the CSEQ Student Acquaintances scale were used to measure the amount and breadth of interaction with peers. Alpha

reliability for the scale was 0.89. The 10 items from the CSEQ Topics of Conversations scale were used to measure the intellectual content of students interactions. Alpha reliability for this scale was 0.86.

Integration was represented by two scales constructed from students' CSEQ responses. The first integration scale, integration of course information, consisted of 5 items from the CSEQ course learning scale. These items focused on the analysis and synthesis of information obtained in and outside class. Alpha reliability for the scale was 0.81. The second scale, integration of information in conversations included three items from the CSEQ Topics of Conversations scale. Alpha reliability for the 3-item scale was 0.80. Educational gains were also measured using students' responses to the CSEQ. Six items were used to measure gains in general education, while three items were used to measure intellectual development. Alpha reliability coefficients were 0.76 for the gains in general education scale and 0.82 for the intellectual development scale.

Data Analysis

The first step in the data analysis was to evaluate absolute differences in college experience and gains measures for the learning-community and traditional residence hall groups. Involvement, interaction, integration, and gains scores for the two groups were analyzed using oneway analysis of variance procedures. Effect sizes (i.e., the differences in group means divided by the standard deviations for all respondents) were calculated for each comparison (see Pascarella and Terenzini, 1991).

The second step in the data analysis involved assessing the invariance of relationships among background characteristics, college experiences, and learning outcomes. Students were divided into learning-community and traditional-residence groups. Traditional-residence students' mean scores on each scale were then subtracted from the score of every student (Jöreskog and Sörbom, 1993). The practical result of this transformation was that means on all measures were zero for students in traditional residence halls, while means for learning-community students represented deviations from the means for traditional-residence students. Once the data transformations were complete, a two-group path analysis, including means, intercepts, and covariances, was conducted using the LISREL 8 computer program (Jöreskog and Sörbom, 1993; Pike, Schroeder, and Berry, in press). All of the variables in the analysis were directly measured because research suggests that manifest variables associated with the same construct may have substantially different effects on other manifest variables in a model (Eimers and Pike, 1997; Pike, Schroeder, and Berry, in press).

As part of the two-group path analysis, the invariance of several models across groups was evaluated to identify similarities and differences between the groups (see Eimers and Pike, 1997). In the first model, means and intercepts for both groups were constrained to be equal to zero (i.e., the actual means for traditional-residence students). All other parameters were constrained to be the same for both groups. This model provided a test of whether the means and the variance-covariance matrices for the two groups came from the same population. In the second model, covariances among the background variables, and covariances among the residuals for college experience and outcomes variables were allowed to vary freely. This model represented the assumption that although relationships among students' background characteristics and error terms might differ, the causal relationships among variables in the model would be the same for both learning-community and traditional-residence students. The variances of all variables were constrained to be invariant across groups for this and subsequent models. In the third model, means for background characteristics and intercepts for learning-community students were allowed to vary freely, although means and intercepts for traditional-residence students were fixed at zero. This model provided a test of the invariance of causal relationships, while also providing an assessment of the direct and indirect effects of learning communities. In this model, the presence of statistically significant intercepts for learning-community students represent direct effects, while the absence of significant intercepts and the presence of significant absolute differences between groups would represent the indirect effects of residential learning communities. In subsequent models, selected structural equations were allowed to vary freely. Modification indices and standardized residuals were used to identify which structural equations should be free to vary (Jöreskog and Sörbom, 1993). These models represented instances in which relationships among background characteristics, college experiences, and learning outcomes were not the same for both groups.

Omnibus chi-square measures of model fit and chi-square change statistics were calculated to identify a model that provided a satisfactory representation of the data. Omnibus chi-square tests of model fit provided a measure of the extent to which the means and covariances implied by the model represented the observed data. For example, a nonsignificant omnibus chi-square test for any of the first three models would indicate that causal relationships among students' background characteristics, college experiences, and learning outcomes were invariance across groups. Chi-square change statistics represented the improvement in model fit attributable to freeing parameters in a model. More specifically, a significant chi-square change statistic indicated that freeing a set of parameters in a model significantly contributed to improved model fit. Thus, a statistically significant chi-square change statistic between the second and third models would indicate that there were significant differences in the intercepts (i.e., direct effects of learning communities) on college experiences and/or learning outcomes. Once an appropriate model was identified, common metric standardized parameter estimates and estimates of direct, indirect, and total effects were calculated. Effects coefficients were examined to identify direct and indirect effects and to determine how models differed for the two groups.

Results

Absolute Differences Between Groups

Table 3 presents means for learning-community and traditional-residence students. Asterisks are included to identify significant differences between the groups. Effect sizes provide an indication of the substantive importance of the observed differences. An examination of the results presented in Table 3 indicates that students in learning communities had substantially higher levels of involvement, interaction, integration, and gains in general education than did traditional-residence students. Reported gains in critical thinking did not differ for the two groups. Examination of effect sizes revealed that differences in levels of involvement and interaction were substantial, ranging from one-third to almost one-half of a standard deviation. The lone exception was interaction with faculty. For that scale, the difference between learning-community and traditional-residence students produced an effect size of 0.19. Effect sizes for integration of course information (0.31) and gains in general education (0.27) were relatively large, while the effect sizes for integration of information in conversations and gains in intellectual development were much smaller (0.18 and 0.10, respectively).

Insert Table 3 about here

Invariance of Relationships Across Groups

Table 4 provides the goodness-of-fit results for the invariance models. An examination of these data indicate that the model representing complete invariance of intercepts and relationships among observed variables provided a very poor explanation of the data ($\chi^2 = 228.88$, $df = 129$, $p < 0.001$). While relaxing invariance constraints on the covariance among exogenous variables and residuals significantly improved goodness of fit ($\Delta\chi^2 = 37.24$, $\Delta df = 23$, $p < 0.05$), the omnibus chi-square test indicated that the model still provided a poor representation of the data ($\chi^2 = 191.64$, $df = 106$, $p < 0.001$). Relaxing invariance restrictions on model means and intercepts provided a substantial improvement in model goodness of fit ($\Delta\chi^2 = 81.27$, $\Delta df = 14$, $p < 0.001$) and also produced a nonsignificant omnibus chi-square result ($\chi^2 = 110.37$, $df = 92$, $p > 0.05$). The substantive interpretation of these findings was that causal relationships among the various components in the theoretical model were the same for both learning-community and traditional-residence students. Consequently, comparisons of intercepts for the two groups were deemed to be appropriate.

Insert Table 4 about here

Intercepts for the structural equations representing relationships among background, college experience, and outcomes measures are presented in Table 5. Statistically significant differences in intercepts indicated that membership in learning communities did exert significant direct effects on involvement and interaction measures, even after controlling for the effects of antecedent variables in the model. Differences in the intercepts for integration and gains variables were not statistically significant. These findings suggest that membership in a learning community exerts a significant direct effect on involvement and interaction, but it does not exert a significant direct effect on integration or gains. The fact that significant differences in observed means were found for integration and gains in general education suggests that the effects of membership in a learning community on integration and gains are indirect.

Insert Table 5 about here

Relationships Among Background, College Experiences, and Gains

Table 6 presents the parameter estimates for the effects of background characteristics on measures of students' college experiences and their gains in learning and intellectual development. An examination of the results in Table 6 suggests that the effects of background characteristics on college experience and gains measures are quite modest. For example, entering ability, as measured by ACT Assessment composite score, was positively related to involvement in art, music and theatre (0.18), involvement in clubs and organizations (0.13), and the intellectual content of interactions (0.14), but it was not related to involvement in residence halls, interaction with faculty, or interaction with peers. ACT Assessment composite scores also exerted significant direct and total effects on integration of course information (0.09 and 0.10, respectively). ACT Assessment composite scores were not significantly related to gains in learning either directly or indirectly.

Insert Table 6 about here

Gender (being female) was positively related to involvement in clubs and organizations (0.12), involvement in residence halls (0.18), interaction with peers (0.14), and integration of course information (0.09). Being female also has a significant total effect on integration of course information (0.14). Gender was not significantly related to involvement in art, music, or theatre, interaction with faculty, the intellectual content of interactions, integration of information of course information, or gains in their general education or intellectual skills. In addition, neither high school class percentile rank nor minority status were significantly related to any of the college experience or educational outcomes components in the model.

Table 7 presents the standardized effects parameters for relationships among college experiences and educational outcomes. An examination of the results in Table 7 reveals that integration of coursework was significantly related to students' involvement in clubs and organizations (0.12),

involvement in residence halls (0.18), interaction with faculty (0.14), interaction with peers (0.09), and the intellectual content of interactions (0.17). Only involvement in art, music, and theatre was not related to integration of information in coursework. Integration of information in conversations was also influenced by all of the involvement and interaction variables except involvement in art, music, and theatre.

Insert Table 7 about here

Although involvement in art, music, and theatre was not related to integration measures, it was significantly related to reported gains in general education (0.20). Other factors influencing gains in general education included interaction with peers (0.12), the intellectual content of interactions (0.17), integration of course information (0.11) and integration of information in conversations (0.14). Factors influencing students' reported gains in intellectual skills were involvement in residence halls (0.14), interaction with faculty (0.14), the intellectual content of conversations (0.20), as well as integration of course information (0.15) and integration of information in conversations (0.29).

An examination of the squared multiple correlations for the structural equations further revealed that the effects of background characteristics on involvement and interaction were trivial, accounting for between 1 and 4 percent of the variance in students' scores. The effects of background, involvement, and interaction on integration of information were more substantial. Squared multiple correlations were 0.27 for integration of information from coursework and 0.46 for integration of information in conversations. Background characteristics and measures of involvement, interaction, and integration have a stronger impact on gains in learning and intellectual development. The squared multiple correlation for the structural equation representing gains in general education was 0.33, while the squared multiple correlation for the structural equation representing the development of intellectual skills was somewhat smaller (0.23).

Discussion and Conclusions

The fact that relationships among background, college experience, outcomes measures were invariant across residential learning communities and traditional residence halls, provided an opportunity to compare mean scores on the involvement, interaction, integration, and outcomes across the two residential groups. In addition, the invariance of relationships across groups made it possible to compare intercepts for the structural equations representing learning communities' effects on involvement, interaction, integration, and learning outcomes. These intercepts, like least-square means in an analysis of covariance, represented the unique effects of type of residential living arrangement on college experiences and outcomes, and a comparison of intercepts and observed means provided an indication of whether the effects of residential learning communities were direct or indirect. A further examination of intercepts and parameter estimates for the structural equations provided an indication of the nature of the indirect effects for residential learning communities.

Overall, three conclusions emerged from the findings of this research. First, students in residential learning communities did have significantly higher levels of involvement, interaction, integration, and learning and intellectual development than did students in traditional residence halls. Also, the effects of residential living arrangements tended to be more pronounced for measures of involvement and interaction than for measures of integration and gains. Specifically, effect sizes for differences in involvement and interaction tended to be relatively substantial while effect sizes for differences in integration and gains were much smaller. A second finding to emerge from this study was that learning communities tended to exert a positive direct effect on day-to-day behavioral aspects of students' college experiences and indirect effects on the integration of information and student learning. This result is consistent with several other studies that have sought to examine the relationships between residential living arrangements and educational outcomes (Lacy, 1978; Pascarella and Terenzini, 1980; Pike, Schroeder, and Berry in press). The third finding to emerge from this study concerned the nature of the indirect effects of residential learning communities on integration and student learning and intellectual development. Higher levels of integration of course information for students in residential learning

communities was largely a results of the positive effects of learning communities on involvement in clubs and organizations, involvement in residence halls, interaction with faculty, interaction, with peers, and the intellectual content of interactions. Perhaps most striking was the fact the fact that the magnitude of the indirect effects was remarkably stable across all five involvement and interaction variables. In contrast, higher levels of integration of information in conversations for students in residential learning communities was largely a function of greater intellectual content in the interactions of learning-community students. The fact that students in residential learning communities reported greater gains in general education could be attributed to higher levels of involvement in art, music, and theatre, interactions with peers, and the increased intellectual content of interactions. The increased intellectual content of learning-community students' interactions also resulted in greater reported gains in general education by acting on integration of information in conversations and, to a somewhat lesser extent, the integration of course information.

Although these findings suggest several interesting possibilities, care should be taken not to over generalize the results. Because the current research was conducted at a single institution, determining whether residential learning communities at other institutions would produce similar results is difficult. The results of this study are definitely limited to institutions with residential populations, and they may be limited to large research universities. In addition, these results represent a snapshot in time. Had measures of involvement, interaction, integration, and learning been taken at different times during the academic year, it is possible that the effects identified in this study would have been different. The fact that students self select into residential learning communities represents a third potential limitation of this research. Although background differences between learning-community and traditional-residence students were relatively small and accounted for in the research, the two groups may differ in ways unaccounted for in this study. Definite conclusions about the effects of residential learning communities must await replication of results across several institutions using longitudinal designs that better capture the causal relationships between background characteristics, educational experiences, and learning outcomes.

Despite these limitations, the findings of this study have important implications for higher education theory, research, and practice. First and foremost, the present research indicates that students' out-of-class experiences can have a positive effect on learning. Consistent with findings reported by Pascarella and Terenzini (1991), content-specific experiences (e.g., involvement in art, music, and theatre) have positive effects on learning in those content domains, but relatively modest effects on broader educational outcomes. Broader and stronger effects are present for more generalized types of involvement and interaction with significant others (i.e., faculty and peers). This finding supports the recommendations of the SLI and the Kellogg Commission that colleges and universities create seamless learning environments to promote student learning and intellectual development. The present research also indicates that residential learning communities represent one method of bridging the gap between students' in- and out-of-class experiences. Although the results of this study await replication, colleges and universities may wish to reexamine the role of residence halls on their campuses.

It is also significant that residential learning communities had a substantial direct impact on students' day-to-day college experiences, but an indirect and less substantial impact on the synthesis of those experiences and learning outcomes associated with college experiences. In fact, a definite ordering of relationships is suggested by the model. Membership in a residential learning community has its greatest impact on day-to-day college experiences, such as cocurricular involvement and interaction with significant others, while the ability to integrate and synthesize day-to-day experiences is most directly influenced by the quantity and quality of the experiences. Gains in learning and intellectual development are most directly influenced by students' integration and synthesis of diverse educational experiences. This finding is consistent with theory and research on how college affects students in general, and how residence halls affect students in particular (Pascarella and Terenzini, 1991; Terenzini, Pascarella, and Blimling, 1996). It implies that colleges and universities should temper expectations that a single educational intervention will have a dramatic effect on student learning and intellectual development. Student learning and development is a complex process involving diverse and sometimes contradictory influences. Given the complex milieu of the college experience, it is unrealistic to assume that any single action will fundamentally alter the nature of American higher education.

The absence of a significant effect of residential learning communities on intellectual development was troubling, although perhaps not unexpected. Wood's (1997) review of research on one measure of intellectual development—the Reflective Judgement Interview (RJI)—found that the nature of the college experience has substantially less effect on intellectual development than did the duration of the college experience. As Pascarella and Terenzini (1991) noted, students' intellectual development tends to be a cumulative process. Moreover, the effects of differences in students' educational experiences on RJI scores tend to be most pronounced at higher levels of educational achievement, suggesting that it is the weight of differences in experiences over time that influences the course of intellectual development.

Also troubling was the absence of substantial effects for faculty-student interaction. Not only were the effects of residential learning communities on faculty-student interaction relatively small, but faculty-student interaction was not as strongly related to gains in learning and intellectual development as other involvement and interaction variables. One possible reason for the relatively weak effects related to faculty-student interaction is a lack of variance in the quality of students' interaction with faculty. This lack of variance can attenuate relationships between faculty-student interaction and other variables. Although the faculty-student interaction scale contained 7 items, compared to 10 items for peer interaction and the intellectual content of interactions, the standard deviation for the faculty-student interaction scale was approximately one-half the standard deviations for the other interaction scales. One possible reason of less variance in faculty-student interaction is that many of the learning community programs are relatively new and efforts to enhance faculty-student interaction are just beginning. . From a programmatic standpoint, this finding would suggest that efforts to create residential learning communities may need to focus special attention on ways to increase the quantity and quality of students' informal interactions with faculty outside class.

Conclusion

The present research suggests that making significant and sustained improvements in students' learning and development requires redefining and blurring traditional boundaries between in- and out-of-class experiences on a variety of levels. Not only does improving undergraduate education require "thinking outside the box," it also requires *frequently* thinking outside the box to create a variety of positive learning experience whose cumulate effect will be enhanced student learning and intellectual development. Stepping outside our traditional roles and responsibilities is difficult, and frequently painful. In this case, however, the alternative may be even more unpleasant as Gee and Spikes (1997) noted. "As never before, we must maintain our relevance by our performance and our ability to change. Otherwise, our institutions of higher education run the risk of being consigned to a sort of academic Jurassic Park—places of great historic interest, fascinating to visit, but no longer relevant in a world that has passed them by" (p. 30).

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Table 1:
Characteristics of CSEQ Respondents and the First-Time-College Students at MU

Background Characteristics	CSEQ Respondents (n=626)	All FTC Students (n=2,406)
Member of Learning Community		
Learning Community	26%	22%
Other Students	74%	78%
Gender		
Female	71%	62%
Male	29%	38%
Ethnicity		
Minority	11%	15%
Non-Minority	89%	85%
Residency		
In State	82%	84%
Out of State	18%	16%
Academic Unit		
Agriculture	10%	10%
Arts & Science	39%	41%
Business & Public Administration	10%	10%
Education	7%	6%
Engineering	8%	7%
Human Environmental Science	2%	2%
Health Related Professions	8%	7%
Journalism	14%	15%
Nursing	2%	2%
Mean ACT Assessment Composite Score	25.9	25.2
Means H. S. Class Percentile Rank	84.2	78.8

Table 2:
Descriptive Statistics for Scales Used in the Research

Scale	Number of Items	Mean	Standard Deviation	Alpha Reliability
Involvement in Art, Music, Theatre	12	17.8	5.42	0.84
Involvement in Clubs & Organizations	10	18.5	6.58	0.90
Involvement in Residence Halls	10	24.8	6.50	0.89
Interaction with Faculty	7	13.6	3.55	0.84
Interaction with Peers	10	24.8	6.32	0.89
Topics of Conversations	10	20.8	5.41	0.86
Integration of Course Information	5	14.0	3.10	0.81
Integration of Information in Conversations	3	7.2	1.95	0.80
Gains in General Education	6	12.9	3.53	0.76
Gains in Intellectual Development	3	7.1	2.14	0.82

Table 3:
Observed Means for Learning-Community and Traditional-Residence Students

	Learning Community	Traditional Residence	Effect Size
Involvement in Art/Music/Theatre	19.52	17.25	0.42
Involvement in Clubs & Organizations	20.73	17.80	0.45
Involvement in Residence Halls	26.28	24.26	0.31
Interaction with Faculty	14.17	13.51	0.19
Interaction with Peers	26.55	24.51	0.32
Intellectual Content of Interactions	22.61	20.20	0.45
Integration of Course Information	14.77	13.81	0.31
Integration of Information in Conversations	7.52	7.16	0.18
Gains in General Education	13.64	12.93	0.27
Gains in Intellectual Development	7.22	7.01	0.10

Table 4:
Goodness-of-Fit Results for the Structural Equations

Model	Residual df	Residual χ^2	Component Δdf	Component $\Delta\chi^2$
Complete Invariance	129	228.88‡	---	---
Exogenous Covariances Relaxed	123	221.03‡	6	7.85
Residual Covariances Relaxed	106	191.64‡	17	29.39*
Restrictions on Intercepts Relaxed	92	110.37	14	81.27‡

*$p<0.05$; †$p<0.01$; ‡$p<0.001$

Table 5:
Intercepts for the Structural Equations

Intercepts for Models Predicting	Learning Communities	Other Students
Involvement Art/Music/Theatre	2.10‡	0.00
Involvement Clubs & Organizations	2.76‡	0.00
Involvement Residence Halls	2.43‡	0.00
Interaction with Faculty	0.72*	0.00
Interaction with Peers	2.26‡	0.00
Intellectual Content of Interactions	2.17‡	0.00
Integration of Course Information	0.24	0.00
Integration of Information in Conversations	-0.32	0.00
Gains in General Education	0.03	0.00
Gains in Intellectual Development	-0.13	0.00

*$p<0.05$; †$p<0.01$; ‡$p<0.001$

Table 6:
Standardized Direct and Total Effects for Background Characteristics

College Experience Measures	ACT Composite	High School Percentile Rank	Gender (Female)	Ethnicity (Minority)
Involvement in Art/Music/Theatre	0.18‡	-0.08	0.05	0.00
Involvement in Clubs & Organizations	0.13†	0.05	0.12†	0.04
Involvement in Residence Halls	-0.06	-0.05	0.18‡	-0.02
Interaction with Faculty	-0.08	0.02	0.00	0.05
Interactions with Peers	-0.01	-0.04	0.14‡	0.02
Intellectual Content of Interactions	0.14†	-0.02	-0.03	-0.06
Integration of Course Information	0.09* 0.10*	-0.04 -0.05	0.09* 0.14‡	-0.04 -0.04
Integration of Information in Conversations	0.05 0.13†	-0.02 -0.03	0.00 0.01	-0.02 -0.04
Gains in General Education	-0.05 0.04	-0.02 -0.05	0.02 0.06	-0.02 -0.03
Gains in Intellectual Development	0.02 0.06	-0.01 -0.02	-0.05 -0.01	0.00 -0.01

*$p<0.05$; †$p<0.01$; ‡$p<0.001$

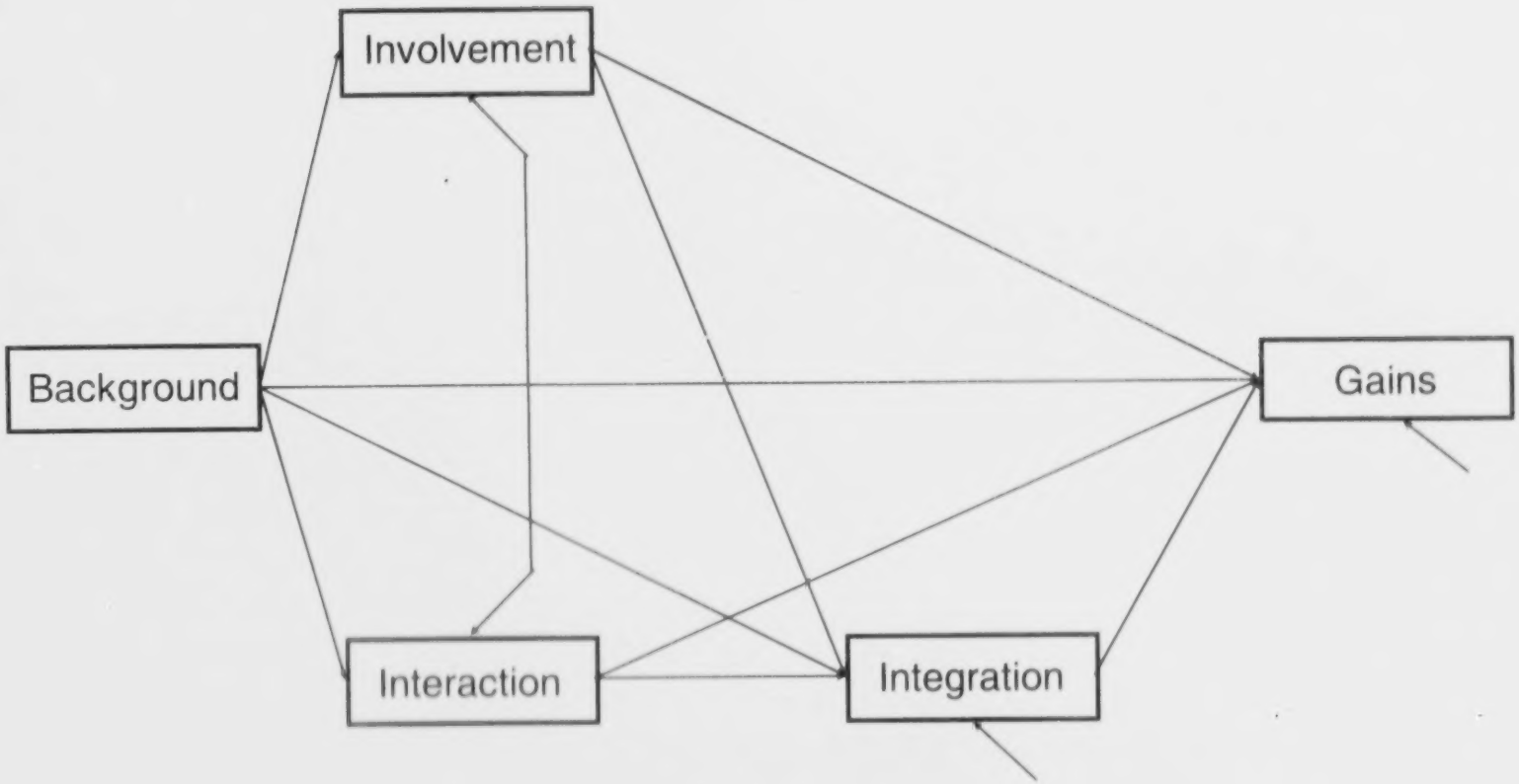
Table 7:
Standardized Direct and Total Effects for College Experiences

	Involvement AMT	Involvement Clubs/Orgs	Involvement Residence	Interaction Faculty	Interaction Peers	Intellectual Content	Integration Coursework	Integration Conversat.
Integration of Coursework	-0.01	0.12†	0.18‡	0.14‡	0.09*	0.17‡		
Integration of Conversations	-0.01	0.09*	0.08*	0.08*	0.08*	0.52‡		
Gains in General Education	0.20‡	0.04	-0.01	0.04	0.12†	0.17‡	0.11†	0.14†
	0.20‡	0.07	0.02	0.07	0.15†	0.27‡		
Gains in Intellectual Development	-0.07	0.03	0.09*	0.09*	0.00	0.02	0.15‡	0.29‡
	-0.08	0.08	0.14†	0.14†	0.03	0.20‡		

*$p<0.05$; †$p<0.01$; ‡$p<0.001$

Figure 1:

Theoretical Model of the Effects of Background and College Experiences on Learning and Intellectual Development


Involvement
Background
Gains
Interaction
Integration